

## **Interferometric Dilatometer Applicable to the Temperature Range from 1273 to 2273 K**

H. Watanabe, N. Yamada, and M. Okaji  
*Thermophysical Metrology Department*  
*National Research Laboratory of Metrology*  
*1-1-4 Umezono, Tsukuba*  
*Ibaraki 305-8563 Japan*

A interferometric dilatometer has been developed for accurate determinations of linear thermal expansions of high-temperature solids from 1273 to 2273 K. The thermal expansion of amorphous carbon has been measured using the dilatometer, which consists of an optical heterodyne interferometer and a single-wavelength radiation thermometer. The interferometer can measure the change in the length of the sample with an uncertainty of nanometer order. The sample was contained in vacuum chamber and heated using carbon heaters. The temperature of the blackbody cavity drilled in the sample was measured using the radiation thermometer. The compensation for the absorption of the radiation by the window of the chamber was estimated by the calibration with a fixed-point blackbody of copper.